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De i Husene skadeligste Insekter og Midder, der angribe og bedœrve vore Madvarer, Klœder, Bohave og svrige Eiendele under Tag. Af W. M. Schoyen. Kristiania, 1876. 12mo, pp. 102. 3 plates.

Enumeratio Insectorum Norvegicorum. Fasciculum III. Catalogum Lepidopterorum Continentem. Auctore H. Siebke defuncto, edidit J. Sparre Schneider. Christiania, 1876. 8vo, pp. 188.

Enumeratio Insectorum Norvegicorum. Fasciculum IV. Catalogum Dipterorum Continentem. Auctore H. Siebke defuncto, edidit J. Sparre Schneider. Christiania, 1877. 8vo, pp. 255.

Some Remarkable Gravel Ridges in the Merrimac Valley. (Abstract.) By George F. Wright. (From the Proceedings of the Boston Society of Natural History, vol. xix.)

I. On the Brains of some Fish-Like Vertebrates. II. On the Serrated Appendages of the Throat of Amia. III. On the Tail of Amia. By Burt G. Wilder. 1876. 8vo, pp. 10, with a plate. (From the Proc. Am. Ass. Adv. Sci. Buffalo Meeting, August, 1876.)

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GENERAL NOTES.

BOTANY.[1]

VIOLETS. — Most of our readers are aware that many species of violets have, in summer, flowers which are totally unlike the showy, attractive blossoms of early spring; for instance, the lance-leaved violet and the arrow-leaved violet bear late, inconspicuous flowers, in which the petals are reduced to the merest rudiments, and only two or three stamens with pollen are present. Flowers of this sort have long been known, but they need to be more carefully examined with reference to their specific peculiarities. It is proposed to give in this note a preliminary sketch of the literature of the subject, in the hope that some of our botanists may collect and study the forms here referred to. Dillenius, in 1732, (Hort. Eltham, 408) observed that *Viola mirabilis* has flowers of two kinds: the spring flowers, with well-developed corolla and stamens seldom produce fruit, but the later flowers, in which he found stamens and no petals, always do. Linnæus (Semina Muscorum Detecta, 1732) refers to *Viola mirabilis* as one of the plants which had been thought to bear fruit without any antecedent blossoms; but he states that in the case of this plant, as in others referred to, blossoms with good stamens and pistils are present. It is said by Dr. Oliver that in a later work Linnæus remarks of *Viola mirabilis* that "the early flowers provided with a corolla are often barren, while others, appearing subsequently, and destitute of a corolla, are fertile."

Conrad Sprengel (1793) refers to *Viola mirabilis* as bearing two kinds of flowers, but states that he had not had an opportunity of examining the plant.

In 1823, De Gingins, in his Mémoire sur la Famille des Violacées, page 11, writes that "most of the species of the section of violets properly so-called have the singular property of sometimes producing incomplete flowers more or less destitute of a corolla; their fruits are nevertheless as perfect as, or even more perfect than, those which follow complete flowers. This phenomenon is observed frequently in autumn at the second blooming of violets; and the exotic species transplanted to our gardens have, under unfavorable conditions, apetalous flowers with deformed essential organs, which nevertheless bear perfect fruit."

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[1] Conducted by PROF. G. L. GOODALE.

From Dr. Oliver's review, previously referred to, we take the following notice of a work to which we do not have present access. M. Monnier, of Nancy (Guillemin's Archives de Botanique, 1833), says that none of the early spring flowers of *Viola hirta* bear fruit. "After the first flowering the leaves take on a further development: they become hairy, and bear in their axils flowers destitute of a corolla and with the five stamens almost always distinct and shorter than the ovary. The peduncles bearing these flowers curve downwards and bury the ovaries under the surface of the soil, where the seeds are ripened."

In a review given at second hand in *Botanische Zeitung* for November, 1854, are some quotations from a memoir by Timbal-Lagrave (On the Genus Viola, 1853): "It is the custom in botany to examine a plant when it is grown, that is, when it has completed its development or has reached the climax of its vegetation and is in flower. This usage, well enough for most cases, is faulty when it is applied to the section *Nominium* of *Viola*. It has here led botanists into errors and doubts, which have rendered the study of this section a matter of great difficulty. The period of early blossoms in *Viola* is the *youth* of the plant; its old age is another epoch in its development which was unknown to the older botanists, and herein lies the ground of the difficulties. . . . . In the stemless violets the following facts can be observed: in early spring a few leaves appear, and these develop until April; then come the blossoms with richly colored petals, and often with some fragrance, but these flowers, although provided with essential organs, are infertile. At first I believed that this anomaly is dependent on some modification of the stigma, or caused by some atmospheric influence, but I am now convinced that it arises from the lack of pollen in the anthers; fertilization cannot take place; the flower soon fades, dries up, or decays without any result.

"In this period, which I call youth, a new growth takes place: from the cluster of persistent radical leaves accompanying the first flowers new leaves arise, which soon become large and acquire firmness, having even larger and stiffer hairs. Towards the end of May and June new flowers come up, but they are very different from the first. In some species the blossoms have no petals, in others only one or two, but these are always inclosed in the calyx and are frequently the merest rudiments. The whole floral apparatus is modified, and yet fertilization takes place. . . . A comparative study of the different organs of the first and second flowers of these plants, the growth or the abortion of this or that part, the position, the duration, and the functions, afford many essential characters which, added to those already known, will aid in the study of this genus."

In *Botanische Zeitung* for October, 1857, Daniel Müller, of Upsal, gives an instructive account and a few figures of the incomplete flowers of certain violets. He states that the anthers contained only a few grains, which did not seem to him like perfect pollen, but rather like minute ovules. In spite of a whimsical theory with which he closes his paper, the account must be valued for the accurate descriptions of the incomplete flowers of several species.

A very interesting paper on this subject was read in July, 1860, before the Botanical Society of France, by M. Eugène Michelet. The statements made by him agree essentially with those just given.

In 1863, Von Mohl (in *Botanische Zeitung*) gives an abstract of the literature relating to cleistogamic flowers, and presents some instructive results of his own observations, of which the following is an abstract: "The process of fertilization in *Viola elatior* F. was more easily investigated than in the other species examined. In this species, as in all apetalous violets, the style is short and hooked, and in immediate contact with the anthers with which it alternates. Besides these two stamens which in this plant I always found developed, I discovered in some flowers one or two more. Although the anther cells are only one seventh to one sixth of an inch long, they have a number of pollen grains. The greater part of these push forth pollen tubes even while they are still in the anther, and these tubes pass out of the upper end of the anther cells, in thick strings, directly to the contiguous stigma. If the stamens in a fresh flower are drawn away from the stigma, the tubes will not break, but the pollen grains will be released from the opened anther cell, so that the latter will be left empty. On tearing away the anthers, some pollen grains which have not pushed out any tubes will fall out from them. It appears to me questionable whether without such a mechanical process pollination from these would take place; at least I have not observed any such case. With the drying of the anthers after fertilization, the tubes in their course from the anthers to the stigma dry up also, and then break off when the anthers separate, without withdrawing the pollen grains which are there held fast. Similar appearances are presented by the anthers in *Viola canina*, which touch the stigma. Besides this, it is seen that from those anthers, which in this species are always turned away from the stigma, pollen tubes start out and pass down in a serpentine course over the upper part of the ovary and the back and sides of the style. This observation is easily made by means of a Lieberkühn illuminating mirror. In this species, also, I frequently found pollen grains which had fallen out of the anthers, but I am not sure whether this discharge takes place naturally; for if we examine anthers which have become dry after fertilization, and on which, therefore, while fresh no force could have been exerted, they will be found thickly filled with pollen grains. These are colorless, finely dotted, and thin-walled, and they wrinkle up when drying.

"The pollen grains of *Viola mirabilis* fall out from the anthers more easily and in greater abundance, and this may be regarded as of regular occurrence. The number of pollen tubes which run from the anthers to the stigmas is far smaller than in the other species spoken of, and the anthers are not so finely fastened on the stigma. Here, too, a part of the pollen will be pulled out by its tubes when the anthers are detached." Von Mohl closes this part of the memoir by stating that, owing to the changes which the pollen of the late flowers undergo in drying, or on access of water, it has been impracticable to compare the pollen of the early large blossoms with that of the late, inconspicuous ones. He further states that in these late flowers fertilization by the pollen of any other flower is of course an impossibility.

It may here be said that, as Timbal-Lagrave suggests, the characters of the late flowers of violets can be of aid in distinguishing species. Koch in his Synopsis has a section headed Flores Seriores Apetali, Later Blossoms without Petals. We do not know of any attempts other than those mentioned above to separate species by means of these peculiarities.

In Kuhn's Memoir, in *Botanische Zeitung* for 1867, a list of forty-four cleistogamic flowers is given, in which *Viola* is mentioned.

Lastly, in Mr. Darwin's new work, Forms of Flowers, 1877, the whole subject has received most careful attention.

SILPHIUM LACINIATUM. — Sections of fresh leaves of *Silphium laciniatum*, the compass plant, show that the parenchyma is composed of "palisade tissue," that is, of the tissue which occurs only immediately beneath the upper surface in most leaves.

Not only are both upper and under surfaces provided with the tissue usually regarded as peculiar to the upper portion of the leaf, but the whole of the leaf pulp from one surface to the other is also composed of it. There are often as many as six closely packed layers of palisade cells. — C. E. BESSEY.

SARRACENIA VARIOLARIS. — The experiments referred to in the June number of the NATURALIST have been repeated by me several times of late, and with uniform results. At the last meeting of the Botanical Section of the Boston Society of Natural History the experiments were again tried in the presence of the members. The results agreed perfectly with those detailed by Dr. Mellichamp. — B. M. WATSON, JR.

BOTANICAL PAPERS IN RECENT PERIODICALS. — *Flora*, No. 16. E. Pfitzer, Observations in Regard to the Structure and Development of Epiphytic Orchids (dealing with the peculiar long cells in the tissue of *Ærides*, and with the occurrence of silicious discs in the pseudo-bulbs of epiphytic orchids, continued in No. 17). Gandoger, New Roses from Southeastern France. No. 17. Dr. Carl Kraus, Causes of the Unvertical Direction of Growth of Shoots. Schulzer, Mycological Notes. No. 18. Dr. Oskar Drude, *Agrostis tarda*, a New Species in the Flora of the Alps. F. Arnold, Lichenological Notes. J. B. Kreuzpointner, Notice in regard to the Flora of Munich.

Botanische Zeitung, No. 26. Prof. Schenk, A Contribution to our Knowledge of the Structure of the Fruits of *Compositæ* and *Labiatæ*. Reports of Societies. No. 27. Christoph Gobi, On a Mode of Growth of the Thallus of *Phæosporeæ*. Dr. Wilh. Jul. Behrens, The Flowers of Gramineæ. Celakovsky, The Theory of the Ovule. Reports of Societies. Nos. 28 and 29. J. Reinke, Remarks in Regard to the Growth at the *Punctum Vegetationis* of *Dictyodaceæ* and *Fucaceæ*. Reports of Societies.

ZOÖLOGY.[1]

RARE SNAKES FROM FLORIDA. — Mrs. A. D. Lungren, of Volusia, has made collections in natural history which have added a number of facts of interest to the herpetology of Florida. She has obtained the *Contia pygæa*, a calamarian form, of which but two specimens are known, both from Volusia. The second specimen of *Dromicus flavilatus* comes from her collections. It will be remembered that the first specimen of this rare species was procured by Dr. H. C. Yarrow, on the coast of North Carolina, at Fort Macon. She has also found the *Helicops Allenii* in the same neighborhood, and a new species of *Chorophilus* (*C. verrucosus* Cope). Persons desiring collections from that region, in any department of natural history, cannot do better than communicate with her. — E. D. C.

RED-BELLIED NUT-HATCH (SITTA CANADENSIS) NESTING ON THE GROUND (?). — On the 27th of May the son of a neighbor brought me four eggs from a nest he discovered in the woods, stating that it was built in a hole in the ground, and that he found it by the old bird's leaving it and attempting to lead him away by the well-known artifices of many ground-building birds. The nest contained six eggs, white, with a faint blush, well covered, especially at the larger end, with coarse reddish-brown spots, mingled with a few faint lilac ones. While he was removing the eggs the bird was very courageous, and seemed much inclined to attack him, but when frightened away alighted on the side of a tree, up which she ran "like a woodpecker." He described the bird as follows: In size, quite small; color of back, blue; of breast and under parts, reddish-brown, a very little white on it, and quite a long bill. As this description was volunteered without any questioning on my part, I think it must be quite correct; and, taken with the climbing habits of the bird, I can think of no bird which it can indicate but the red-bellied nut-hatch, though I have never known that bird to be described as nesting elsewhere than in a tree or stump. The eggs meas-

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[1] The departments of Ornithology and Mammalogy are conducted by Dr. ELLIOTT COUES, U. S. A.